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REMARKS

Claims 1-8, 13-22, and 24 will be pending upon entry of the present amendment. Claim 13 is being amended to correct an obvious typographical error. Claim 23 is being cancelled. Claims 9-12 were previously cancelled.

Drawings - Figures 1-3 have been amended to reflect their prior art status and one sheet of drawings is presented herewith for approval.

The applicants would like to thank the Examiner for his time and courtesy in conducting a telephone interview with the applicants' attorney, Robert Iannucci, on September 10, 2003. The Examiner agreed to reconsider the pending claims in view of the discussion during the telephone interview.

Claims 1-4, 7-8, and 13-20 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,994,202 to Gambino et al. ("Gambino").

In the Amendment filed May 5, 2003, the applicants pointed out that Gambino does not disclose the invention recited in amended claims 1-4 and 7-8 because Gambino does not disclose a method that requires implanting only one type of dopant prior to forming a conductive gate on the active area. The Examiner responded that the claims do not recite the feature "without requiring two implant steps of dopants of opposite conductivity type."

During the telephone interview, the applicants' attorney pointed out that the applicants' argument is supported by the actual language of claim 1. In particular, claim 1 recites a method that includes: 1) **implanting a dopant of a first type only** to provide a channel zone of a MOS transistor in the active area, whereby the implantation in an area located under the spacer is less deep than in the rest of the active area; and 2) forming a conductive gate on the active area after the implanting step **without implanting any dopants of other than the first type** in the active area prior to forming the conductive gate.

Gambino does not disclose the implanting and forming steps which together require implanting only one type of dopant prior to forming a conductive gate on the active area. Instead, Gambino performs first and second implants of opposite conductivity types, as shown in Figs. 2D and 2E. The two implant steps of Gambino enable Gambino to achieve a **deeper** effective doping of P-type (boron) ions directly under the spacers 16 than in the central area

between the spacers. In contrast, claim 1 specifies that "the implantation in an area located under the spacer is **less deep** than in the rest of the active area."

The Examiner also points to figures 2A-2E and column 9, lines 10-26 of Gambino as disclosing "forming a conductive gate (35) on the active area after the implanting step without implanting any dopants of other than the first type in the active area prior to forming the conductive gate," but the Examiner is mistaken. Figure 2E clearly shows two implants (note the "+" marks 20a-d and "-" marks 22a-d) in the same active area prior to forming the conductive gate 35 in Figure 2F. Note that column 6, lines 34-38 and column 10, lines 27-34 of Gambino specify that the conductive gate is formed in Figure 2F after the N- and P-dopants are implanted in Figures 2D and 2E.

Accordingly, Gambino does not anticipate amended claims 1-4 and 7-8.

With respect to claims 13-20, Gambino does not disclose the claimed invention for at least two reasons. First, Gambino does not disclose forming such a spacer with a concave surface. Second, Gambino does not disclose performing a first dopant implant while the first spacer acts as a mask to allow dopants to extend deeper into a central portion than into the first peripheral portion.

Instead of a concave spacer, Gambino requires the spacer to be convex so that none of the N-type (arsenic) ions are implanted into the corner regions 25 adjacent to the insulators 18a-c. Gambino reserves those corner regions 25 for the P-type (boron) ions that are implanted in the second implant step in order to adjust the threshold of the MOS transistor being made. In contrast, the concave spacer of the claimed invention enables the threshold voltage of a parasitic transistor, formed adjacent to the insulating area, to be adjusted without requiring two implant steps of dopants of opposite conductivity type.

Rather than allowing dopants to extend deeper into a central portion than into a peripheral portion, Gambino explicitly states that the effective doping should be higher in the corner regions 25 than in the central portion of the channel (see col. 9, lines 15-23). In particular, Gambino states: "If the arsenic doping in the channels has a concentration of about 1×10^{17} atoms/cm³, then this produces a net phosphorus type **doping in the center of the channels ... which is approximately 33% lower than the concentration at the corners ...** (col. 10, lines

10-15). Thus, Gambino teaches away from the claimed element of allowing dopants to extend deeper into a central portion than into a peripheral portion.

Accordingly, Gambino does not anticipate claims 13-20.

Claims 21-24 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,235,596 to Liao.

Liao does not anticipate claims 21-22 and 24. Claim 21 recites a method that includes: 1) performing a high-energy first implant of first dopant type into a substrate region to create a well that extends in the substrate at a bottom side of a first insulation area; and 2) performing a low-energy second implant of the first dopant type into the substrate region to create a doped active area. Liao does not perform both a high-energy implant and a low-energy implant. Instead, Liao forms three threshold-doped regions 140, 160, 180 that are all of the same energy, as seen by the equal depth of the three regions in Fig. 4. As explained in column 3, Liao achieves three threshold voltage by varying the width of the threshold-doped regions without any suggestion of employing a high-energy implant in addition to a low-energy implant.

In addition, claim 21 recites that the high-energy implant creates a well that extends in the substrate at a bottom side of a first insulation area, which is not disclosed in Liao. As clearly seen in Figure 4 of Liao, the implanted regions 140, 160, 180 extend less than halfway down the side of the trench isolation structure 130, and thus, are not even close to the bottom side of the isolation structure 130.

Accordingly, claims 21-22 and 24 are not anticipated by the cited prior art.

Claims 13-20 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner stated that it was not clear where the specification supports "the first spacer having a concave surface" in claim 13.

The applicants submit that claims 13-20 are properly supported by a written description of the invention. The use of a spacer having a concave surface is supported by the discussion on page 6, lines 2-26, as well as by Figures 4B and 4C, even though the original specification does not use the term "concave." In particular, page 6, lines 6-8 describe the spacer 14 thinning down from the edge of an insulating area 11 towards the central portion of the active area. Further, lines 8-10 describe the spacer 14 as being "bell-shaped." Moreover, lines 15-26 of

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page 6 describe the use of the concave spacer 14 to produce a dopant implantation that penetrates less deeply at the periphery of the active area, as shown in Figure 4C. These descriptions, particularly when viewed in the context of the clear showing in Figures 4B, 4C of a concave spacer, provide written support for the recitation in claim 13 of a "first spacer having a concave surface."

The applicants note that Section 112, first paragraph, does not require the use in a claim of identical language used in the specification. *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.2d 1320, 1323 (Fed. Cir. 2000). Rather, the specification need only describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the invention. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991). The discussion on page 6 of the original specification, when viewed in context with Figures 4B, 4C, does describe the claimed invention in sufficient detail that one skilled in the art would reasonably conclude that the applicants had possession of the invention.

For the foregoing reasons, claims 13-20 are supported by an adequate written description of the invention.

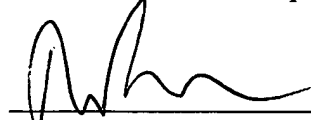
The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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